Orbital
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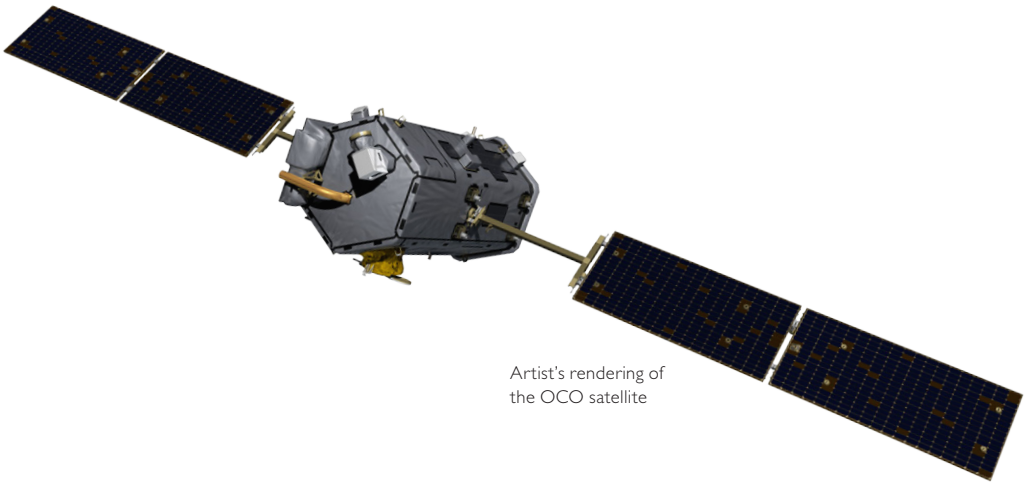
FACT SHEET

OCO

Orbiting Carbon Observatory



Artist's rendering of the OCO satellite

Mission Overview

The Orbiting Carbon Observatory (OCO) was designed to make the first space-based measurements of atmospheric carbon dioxide (CO_2), an important greenhouse gas. Fossil fuel use and other human activities have almost doubled the concentrations of this gas since the beginning of the industrial revolution. Atmospheric carbon dioxide is an efficient greenhouse gas because it absorbs and traps infrared radiation (heat) emitted by the Earth's surface, preventing it from escaping to space. OCO measurements will help scientists to better understand how increasing CO_2 concentrations will drive climate change around the globe.

Although the biosphere and oceans currently absorb about half of the CO_2 generated by human activities, the nature and geographic distribution of the sources and "sinks" of carbon dioxide are not clearly understood. By providing the first global CO_2 measurements from space, the two-year OCO mission was intended to revolutionize our understanding of the global carbon cycle. Orbital built the spacecraft under a contract from the Jet Propulsion Laboratory. The spacecraft was lost due to a launch vehicle failure.

QUICK FACTS:

Each carbon dioxide molecule includes one carbon atom (C) sandwiched between two oxygen (O) atoms, forming a linear molecule, with the structure O=C=O

All animals release CO_2 into the atmosphere as a by-product of metabolism. Plants absorb CO_2 from the air and use it, sunlight, water and oxygen to produce their own energy (photosynthesis). Nearly everything we eat comes directly or indirectly from this "carbon cycle."

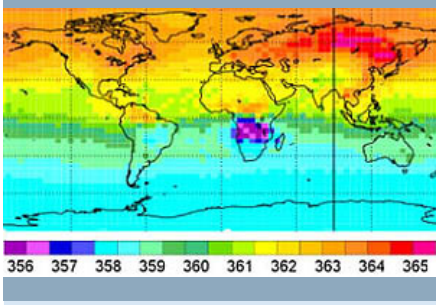
Dr. David Crisp of JPL was the principal investigator for the mission, which included more than 19 university, corporate and international partners.

Mission:

NASA Earth System Science Pathfinder (ESSP) program

Customer:

Jet Propulsion Laboratory - Pasadena, CA



Simulated OCO science data product showing Column CO_2 (4° x 5° grid)

OCO

Specifications and Salient Features

Spacecraft

Satellite Mass:	447 kg (985 lb.)
Solar Arrays:	Triple junction GaAs
Power:	521 W orbit average
Communications:	Redundant S-band transponder and X-band science data transmitter
Stabilization:	3-axis, zero momentum
Propulsion:	Hydrazine
Orbit:	705 km, flying in polar, sun-synchronous formation with EOS Aqua-train
Mission Life:	24 months
Status:	Lost due to launch vehicle failure

Payload

Instrument:	3 grating spectrometers operating in pushbroom mode
Bandpasses:	0.76, 1.58, 2.06 microns
Instantaneous Field of View:	1.0 km x 1.5 km
Swath:	10 km

Launch

Launch Vehicle:	Taurus® XL
Site:	Vandenberg Air Force Base, CA
Date:	February 24, 2009

Mission Team

Jet Propulsion Laboratory (JPL)

Pasadena, CA – Principal Investigator: Dr. David Crisp, JPL; Project management, system engineering, ground data systems and operations lead

Orbital Sciences Corporation

Dulles, VA; Chandler, AZ; Vandenberg Air Force Base, CA – Spacecraft design, integration & test, launch operations, spacecraft flight operations and Taurus launch vehicle

Hamilton Sundstrand Sensor Systems

Pomona, CA – Science instrument

Science Team

International science team with co-investigators from the United States, France, Germany, New Zealand, and Australia

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